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10/612,882	07/02/2003	Jeffrey R. Foerster	42P16296C	7003

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BLAKELY SOKOLOFF TAYLOR & ZAFMAN
12400 WILSHIRE BOULEVARD
SEVENTH FLOOR
LOS ANGELES, CA 90025-1030

EXAMINER	
AGHDAM, FRESHTEH N	

ART UNIT	PAPER NUMBER
2611	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/612,882	FOERSTER ET AL.	
	Examiner	Art Unit	
	Freshteh N. Aghdam	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 March 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-49* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-49* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _____ is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Specification

The abstract of the disclosure is objected to because a patent abstract should be a concise statement of the technical disclosure of the patent and should include that which is new in the art to which the invention pertains.

Correction is required. See MPEP § 608.01(b).

Claim Objections

Claims 1, 7, 19, 20-22, 26-28, and 34-36 are objected to because of the following informalities:

As to claims 1, 20-22, 26-28, and 34-36, the "antenna(e)" should be replaced by "antenna(s)".

Claims 7 and 19 are missing; therefore, for examination purposes and in view of the copending application 10/379.395, the examiner is considering that the same claims 7 and 19 should have existed in the set of claims of the instant application.

As to claim 26, this claim has been repeated twice. For examination purposes, the examiner is considering the first claim 26 as 26.1 and the second claim 26 as claim 26.2.

Appropriate correction is required.

Double Patenting

A rejection based on double patenting of the "same invention" type finds its support in the language of 35 U.S.C. 101 which states that "whoever invents or discovers any new and useful process ... may obtain a patent therefor ..." (Emphasis added). Thus, the term "same invention," in this context, means an invention drawn to identical subject matter. See *Miller v. Eagle Mfg. Co.*, 151 U.S. 186 (1894); *In re Ockert*, 245 F.2d 467, 114 USPQ 330 (CCPA 1957); and *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970).

A statutory type (35 U.S.C. 101) double patenting rejection can be overcome by canceling or amending the conflicting claims so they are no longer coextensive in scope. The filing of a terminal disclaimer cannot overcome a double patenting rejection based upon 35 U.S.C. 101.

Claims 1-49 of the instant application are provisionally rejected under 35 U.S.C. 101 as claiming the same invention as that of claims 1-49 of copending Application No. 10/379,395. This is a provisional double patenting rejection since the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1- 4, 13, 17-18, 20-21, 23-26.1, 26.2, 27, 29-34, 36-40, 43-46, and 49 are rejected under 35 U.S.C. 102(e) as being anticipated by Batra et al (US 2004/0151109).

As to claims 1, 23-24, 26.1, 36, 38, and 43, Batra teaches a transmitter (Fig. 39) to generate a multiband ultra-wideband (UWB) signal for transmission via one or more antenna(s), wherein the generated multiband UWB signal is composed of a number of narrow band pulses (i.e. chips or bits) in a number of different frequency bands (i.e. channels or carriers), wherein the number of sequential or parallel pulses within a given narrower band (i.e. hop or sub-band or sub-carrier) is greater than one pulse (i.e. chip or bit) by employing a time-frequency interleaved OFDM in conjunction with an ultra-wideband physical layer (Abstract; Fig. 39, block interleaver (4 symbols) and symbol mapper 410; Par. 22-27, 33, 75, 80-83, and 365-367).

As to claims 2-4 and 39-40, Batra teaches that the transmitter encodes received content for transmission through selected ones of the narrower band pulses of the generated multi-band ultra-wideband signal, wherein the encoder incorporates error correction information therein (Fig. 5 and 39, means 404, 406, 410, 430, 432, and 434; Par. 365-367).

As to claim 13, Batra teaches that the transmitter includes one or more interleaver(s) responsive to the encoder(s) to interleave the encoded content across a number of blocks of content (Fig. 39, the block interleaver; Par. 365).

As to claims 17-18, Batra teaches that the transmitter further receives the encoded content, up-converts and multi-band modulates the received content using QPSK modulation and prepare it for transmission across a number of pulses within relatively narrow bands of an ultra-wideband spectrum (Fig. 39, means 426, 428, 430, 432, 434, and the antenna; Par. 365-366). Batra does not expressly disclose an RF

modulation; however, it is inherent that the signal that is to be transmitted via antenna(s) upconverts to the radio frequency.

As to claim 20, Batra teaches a receiver with one or more antenna(s) to receive and demodulate each of a number of pulses spread across multiple narrower bands of an ultra-wideband spectrum to recover content embedded therein (Fig. 40, means 502, 504, 506, 508, 518, 520, 522, 524, 526, 528, and 536; Par. 374-375).

As to claim 21, Batra teaches that one or more antenna(s) through which the apparatus can transmit and/ or receive multi-band UWB signal(s) see (Fig. 39-40).

As to claim 25, Batra teaches that the number of narrower bands of the ultra-wideband spectrum is 15 or less, each band 500 MHz wide, supporting 500+ Mbps (Fig. 39; Par. 365; Table 27).

As to claims 26.2 and 37, Batra teaches a receiver responsive to one or more antenna(s) to receive an ultra-wideband signal composed of a number of pulses (i.e. chips or bits) within narrower bands (i.e. sub-carrier or sub-band) within narrower bands of an UWB spectrum, wherein the number of pulses within each of the narrower bands is one or more and is dynamically controlled by the receiver and/ or transmitter (Fig. 39 and 40, means 434 and 512; Par. 365).

As to claim 27, Batra teaches detecting energy (Fig. 40, means 538) and performing synchronization and channel estimation (Fig. 40, means 530, 538; Par. 375-376).

As to claim 29, Batra teaches that the receiver comprising a radio frequency front end to receive signals within one or more of the number of multiple narrower bands of

the ultra-wideband spectrum and to demodulate the received signal (Fig. 40, all the blocks before the FEQ; Par. 375-376).

As to claim 30, Batra teaches that the demodulation performed in the receiver is complementary to the modulation performed by the transmitter (Fig. 39-40).

As to claim 31, Batra teaches performing QPSK demodulation (Fig. 40; Par. 365-367 and 375-376).

As to claim 32, Batra teaches a digital backend (Fig. 40) to correct at least a subset of errors encountered during transmission and to decode (Fig. 40, means 542) content embedded within a demodulated representation of the received MB-UWB signals to produce a representation of content transmitted to the receiver from the transmitter (Par. 375-376).

As to claim 33, Batra teaches the digital backend comprises one or more of a feedforward equalizer, a despreader, a combiner, a block deinterleaver, a detector, a feedback equalizer, and/ or a decoder, coupled to identify and correct at least a subset of errors encountered during transmission of the MB-UWB signals and to distinguish encoded content embedded within the received signals intended for the receiver from those intended for other receiver(s) see (Fig. 40).

As to claim 34, Batra teaches one or more antenna(s) coupled to the receiver, through which the receiver receives MB-UWB signals (Fig. 40).

As to claims 44 and 49, Batra teaches demodulating and decoding (Fig. 40) content received within a number of sequential pulses within a number of narrower

bands (2 bits mapped to a symbol) of a multi-band ultra-wideband signal, wherein the number of sequential pulses within any given narrower band (subcarrier or subband) is greater than one.

As to claim 45, Batra teaches detecting narrowband interference associated with one or more bands of the received multi-band UWB and mitigating harmful effects of the detected interference (equalizing) within the MB-UWB signal (Fig. 40, means 540; Par. 375-376).

As to claim 46, Batra teaches dynamically turning off one or more channels or tones in order to stop transmitting signal on the channel(s) in order to avoid the interferer (Par. 360).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Batra et al.

As to claim 14, Batra teaches that the transmitter includes a spreader responsive to the interleaver (Fig. 39, means 414; Par. 365). Batra does not expressly teach that the spreader employs a pseudorandom noise sequence. One of ordinary skill in the art would clearly recognize that it is well known in the art to spread the encoded interleaved

signal by employing a pseudorandom noise sequence in order to increase the bandwidth and lower power consumption in a communication system.

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Batra et al, and further in view of Lakkis (US 7,031,371).

As to claim 15, Batra teaches adding pilot tones to the spreaded signal (Fig. 39, means 414; Par. 365). Batra is silent about the transmitter includes a preamble to facilitate timing synchronization. Lakkis teaches adding a preamble sequence to the encoded interleaved data for frame synchronizing purposes (Fig. 3, means 64 and 66). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teaching of Lakkis with Batra for frame synchronization in the receiver (Col. 5, Lines 29-37).

Claims 5-6, 7, 8, and 41are rejected under 35 U.S.C. 103(a) as being unpatentable over Batra et al.

As to claims 5 and 41, Batra teaches the transmitter comprises one or mapper(s), responsive to the encoder(s) see (Fig. 39, means 404, 406, and 410) to perform qudrature phase shift keying on the encoded content. Batra does not expressly teach performing m-ary binary orthogonal keying on the encoded content. However, one of ordinary skill in the art would clearly recognize that it is well known in the art to perform various modulation coding schemes depending on the desired data rate and/ or transmit power since as the data rate goes up the transmission power goes down and recovering and estimating the transmitted data in the receiver becomes more complicated and vice a versa.

As to claim 6, Batra teaches that the transmitter comprises one or more interleaver(s), responsive to the binary orthogonal mapper(s) to interleave the encoded content across a number of blocks of content (Fig. 39).

As to claim 7, Batra teaches all the subject matter claimed above, except that the encoded data is interleaved across four blocks of content. One of ordinary skill in the art would clearly recognize that it is a design choice to have exactly four blocks of data to be interleaved.

As to claim 8, Batra teaches that the transmitter includes a spreader responsive to the interleaver (Fig. 39, means 414; Par. 365). Batra does not expressly teach that the spreader employs a pseudorandom noise sequence. One of ordinary skill in the art would clearly recognize that it is well known in the art to spread the encoded interleaved signal by employing a pseudorandom noise sequence.

Claims 22 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Batra et al, and further in view of Woodhead et al (US 2002/0119797).

As to claims 22 and 35, Batra is silent about employing frequency division duplex (FDD) to enable simultaneous transmission and reception on separate frequencies using a common antenna(s). Woodhead teaches that it is well known in the art to separate uplink and downlink either in frequency (i.e. FDD) or in time (i.e. TDD) see (Par. 47). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teaching of Woodhead with Batra in order to better utilize the transmission bandwidth.

Claims 19 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Batra et al, and further in view of Dohler et al (US 2004/0131025).

As to claims 19, 42, and 48, Batra teaches all the subject matter claimed above, except for implementing the method of Batra by employing a storage medium. Dohler teaches implementing a method in a machine-readable medium (Par. 283). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teaching of Dohler with Batra in order to execute a method (Par. 283).

As to claim 48, Batra teaches all the subject matter claimed above, except for implementing the method of Batra by employing a storage medium. One of ordinary skill in the art would clearly recognize that it is well known in the art to implement a method in a machine-readable medium.

Claims 9-12 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Batra et al, and further in view of Lakkis (US 7,031,371).

As to claim 9, Batra teaches adding pilot tones to the spreaded signal(Fig. 39, means 414; Par. 365). Batra is silent about the transmitter includes a preamble to facilitate timing synchronization. Lakkis teaches adding a preamble sequence to the encoded interleaved data for frame synchronizing purposes (Fig. 3, means 64 and 66). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teaching of Lakkis with Batra for frame synchronization in the receiver (Col. 5, Lines 29-37).

As to claims 10-11, Batra teaches that the transmitter further receives the encoded content, up-converts and multi-band modulates the received content and

prepare it for transmission across a number of pulses within relatively narrow bands of an ultra-wideband spectrum (Fig. 39, means 426, 428, 430, 432, 434, and the antenna; Par. 365-366).

As to claim 12, Batra teaches that the multiband modulator modulates the received content using quadrature phase shift keying (QPSK). One of ordinary skill in the art would clearly recognize that it is well known in the art to binary phase shift keying modulating the signal before transmission through antenna(s) instead of QPSK modulating in order to lower the data rate and simplify the decoding process in the receiver.

As to claim 28, Batra teaches a timing synchronization responsive to the one or more antenna(s) to perform one or more of coarse and/ or fine timing synchronization. Batra does not expressly teach that the synchronization is at least based in part on detection of preamble information within a selected band of the number of narrower bands within the UWB spectrum. Lakkis teaches adding a preamble sequence to the encoded interleaved data for frame synchronizing purposes (Fig. 3, means 64 and 66). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teaching of Lakkis with Batra for frame synchronization purposes to enhance data recovery and estimation in the receiver (Col. 5, Lines 29-37).

Claim 47 is rejected under 35 U.S.C. 103(a) as being unpatentable over Batra et al, and further in view of Poulbere et al (US 6,785,350).

As to claim 47, Batra teaches analyzing a band within the multiple bands of MB-UWB to perform channel clearance activity (Fig. 40, means 538) and timing

synchronization (Fig. 40, means 530-538). Batra is silent about acquiring timing synchronization based on preamble information identified within a signal that exceeds a threshold within the select band. Poulbere teaches acquiring timing synchronization based on preamble information identified within a signal that exceeds a threshold within the select band (Col. 3, Lines 16-42). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teaching of Poulbere with Batra in order to perform frame synchronization in the receiver to detect data packet more reliably.

Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Batra et al, and further in view of Boutros et al (US 2002/0181622).

As to claim 16, Batra teaches all the subject matter claimed above, except for the preamble is generated through a number of instances of a CAZAC-16 for at least a subset of the narrower bands of the ultra-wideband signal. Boutros teaches generating a preamble sequence through a CAZAC sequence (Par. 36). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teaching of Boutrs with Batra in order to provide steeply sloped autocorrelation responses for accurate timing synchronization.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Darby et al (US 2003/0078924) see abstract; Shattil (US 2003/0147655); and Ho (US 2004/0170217).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Freshteh N. Aghdam whose telephone number is (571) 272-6037. The examiner can normally be reached on Monday through Friday 9:00-5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh Fan can be reached on (571) 272-3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Freshteh Aghdam
May 8, 2006

KEVIN BURD
PRIMARY EXAMINER